

# Deployable Composite Booms (DCB)

Completed Technology Project (2016 - 2021)



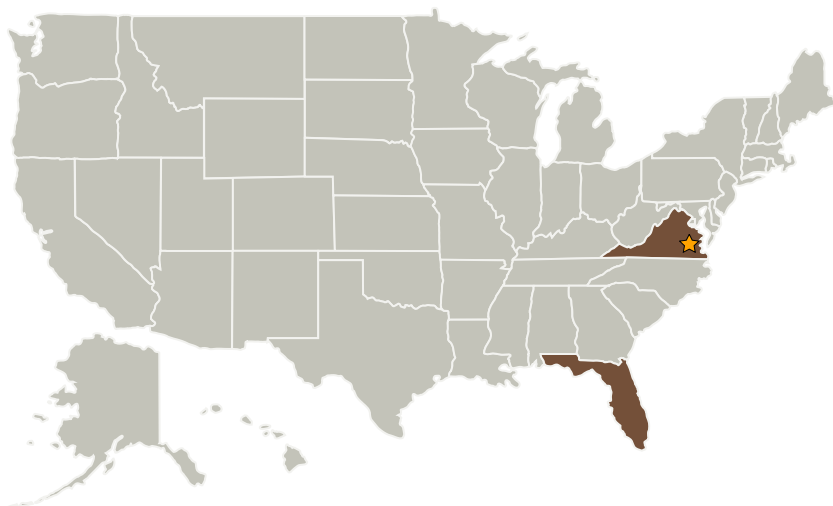
## Project Introduction

The objective of the DCB project is to mature deployable composite boom technology for use in low-cost, small volume, CubeSat/ESPA class satellite deployable systems and as possible deployables for lunar surface application (surface power, comm., science, other).

## Anticipated Benefits

- DCB boom technology will enable NASA, other government agencies, and commercial industries to develop smaller overall spacecraft solutions also bringing down launch costs through application to CubeSat/ESPA class spacecraft
- DCB boom technology can be applied as the deployable for small spacecraft solar sail propulsions systems supporting low-cost long duration operational needs (3-5 years) achieving the objectives of more expensive, larger ESPA-class solar sail systems and as a long-life alternative to other CubeSat-class propulsion systems
- DCB boom technology application also possible for use in lunar surface deployable systems: power; communications, science

## Primary U.S. Work Locations and Key Partners



## Deployable Composite Booms

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Organizations Performing Work	Role	Type	Location
★ Langley Research Center (LaRC)	Lead Organization	NASA Center	Hampton, Virginia
Advanced Cooling Technologies, Inc.	Supporting Organization	Industry	Lancaster, Pennsylvania
Massachusetts Institute of Technology (MIT)	Supporting Organization	Academia	Cambridge, Massachusetts
North Carolina State University at Raleigh	Supporting Organization	Academia	Raleigh, North Carolina
Patz Materials & Technologies	Supporting Organization	Industry	Benicia, California
Purdue University- Main Campus	Supporting Organization	Academia	West Lafayette, Indiana
Touchstone Research Laboratory, Ltd.	Supporting Organization	Industry	Triadelphia, West Virginia
University of Central Florida (UCF)	Supporting Organization	Academia Hispanic Serving Institutions (HSI)	Orlando, Florida
University of Nebraska-Lincoln	Supporting Organization	Academia	Lincoln, Nebraska
Virginia Polytechnic Institute and State University (VA Tech)	Supporting Organization	Academia Asian American Native American Pacific Islander (AANAPISI)	Blacksburg, Virginia

## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Center / Facility:**

Langley Research Center (LaRC)

**Responsible Program:**

Game Changing Development

## Project Management

**Program Director:**

Mary J Werkheiser

**Program Manager:**

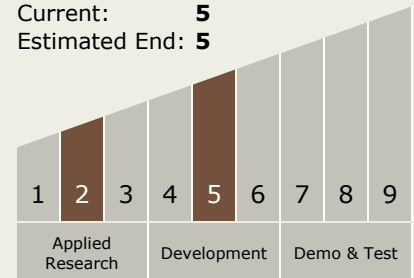
Gary F Meyering

**Project Manager:**

Phillip L Brown

## Technology Maturity (TRL)

Start: 2  
 Current: 5  
 Estimated End: 5



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Co-Funding Partners	Type	Location
Game Changing Development(GCD)	NASA Program	
Small Business Innovation Research	NASA Program	
Technology Transfer	NASA Other	

Primary U.S. Work Locations	
Florida	Virginia

## Images

## Deployable Composite Booms (DCB).png

Rendering of a future CubeSat-based solar sailcraft that will use the composite booms under development to deploy, tension and support the reflective ultra-thin membrane. As depicted, such a solar sail can be used to travel to Near Earth Asteroids (NEA) to gather strategic knowledge-gap information for future mission planning.

(<https://techport.nasa.gov/image/>)

## Project Website:

<https://www.nasa.gov/directorates/spacetech/home/index.html>

## Technology Areas

## Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - └ TX12.1 Materials
    - └ TX12.1.3 Flexible Material Systems

## Target Destinations

Earth, The Moon

## Supported Mission

## Type

Push